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# The MONTHLY REVIEW

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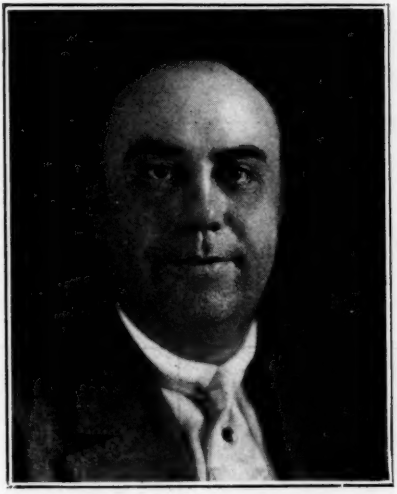

J. F. HANLON

Courtesy Metal Industry

## AUGUST, 1924

Entered as second-class matter, September 26, 1922, at the Post Office at Oneida, N. Y., under the Act of August 24, 1912.

Acceptance for mailing at special rate of postage, provided for in section 1103, Act of October 3, 1917, authorized September 26, 1922.

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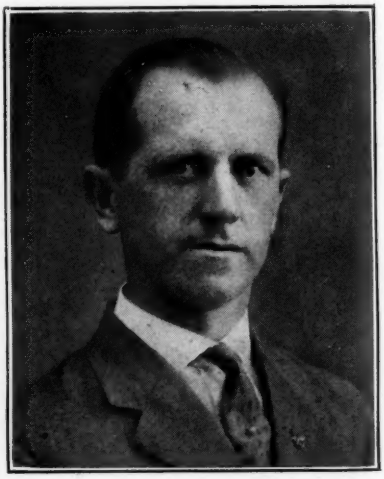

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Courtesy Metal Industry

# MONTHLY REVIEW

Published by the

American Electroplaters' Society

ONEIDA, NEW YORK

Editor's Office, 166 Willow Place, Sherrill, New York

VOL. XI AUGUST, 1924 No. 8


## PRESIDENTS PAGE

To the Membership Greetings:

In my message this month, I desire to discuss what I consider a most important work of the Society during the present year, if not the most important I refer to the work to be considered by the Committee. I have appointed on the question of Sustaining Membership, to review and investigate this subject brought up by the Detroit Branch, through the proposed Amendment, to the constitution, the substitute by St. Louis Branch, and the proposal by Chicago Branch as a preferred procedure over both the Amendment and the Substitute.

The committee which has charge of this work, have a very hard task and its progess wil naturally be slow due to the fact that all its members are located in different cities, and the added fact that it will have a great mass of ideas and opinions to weigh and consider to enable them to arrive at conclusions to report to our next annual meeting in Montreal.

All of the Branches have copies of the Amendment offerred by Detroit Branch, also the substitute by St. Louis Branch, as well as the proposal by Chicago Branch to take the place of both the Amendment and the Substitute. All of these papers were circulated through the Branches shortly before the recent Convention and very likely in some instance's did not receive consideration at a regular branch meeting. I therefore recommend that these matters be brought up again at a regular branch meeting, for due consideration, and that the Chairman of Sustaining Membership Committee, Mr. H. H. Wiliams, 4156 Botanical Ave., St. Louis, Me., be advised of the result of your dscusson, in some cases the Branches have taken definite action

on the Amendment and Substitute, but I don't believe the proposal in preference to both offered by Chicago Branch has had consideration by a Branch meeting, and it is only fair that it should have such consideration, it is a matter of record here that a copy of this proposal was mailed to all branch Secretary's and should be available to be read and discussed at your meetings.

I wish to suggest caution in your deliberations on these matters in effect that they should not be weighed from the standpoint of local interests alone, but rather upon the bread basis of what is best for the general good of the SOCIETY at large.

I would also recommend in this connection that the local membership of the branches through its officers or duly appointed members sound out the sentiment locally, as to the interest in the idea of sustaining membership and to just what extent such interest is manifested, and incorporate this data in your report to the Chairman of the Committee, Mr. H. H. Williams.

If these recommendations are acted upon you will help greatly in deciding a big question, and be of great assistance to the committee, in manner as above suggested.

Further let me caution those of you who may think there is plenty of time, and be inclined to let this matter lag, that it is of **vital** importance that you dismiss such **idea's** and get to work at **once,** with meetings of Branches once a month and the time required for the Comittee to circulate the information submitted to them, that each may review it, you can easy appreciate that time is precious, even now, so **Let's Go,** and as some anonymous writer has said

We're a society free from hate,
Let's go.
We can keep it strong and great,
Let's go.
Land of freedom, land of mirth,
Happiest land upon the Earth;
Let us show her what we're worth,
Lets' go.

FRANK J. HANLON
Supreme President.

## THE FUTURE PROGRESS OF THE AMERICAN ELECTROPLATERS' SOCIETY

By Charles H. Proctor

Members and guests at the Twelfth Annual Convention of the American Electroplaters' Society, it gives me great pleasure to address you upon the subject of the future progress of the American Electroplaters' Society.

It is not necessary to revert to the past history of this Society to seek for its future progress, because the future is not of the past. In the fifteen years of its history it has been a part of the epoch that has marked the commercial industrial supremacy of the United States in the commerce of the world and in world affairs. Every addition to true knowledge is an addition to human power and our Society is playing its part.

Its future progress will be a part of the future progress of this great country; a part of the progress of the great United States, whose destiny, planned by the great Creator, shall lead her to the Courts of Universal Justice; shall make her the arbiter of the nations of the earth, and shall lead them to the paths of universal peace and the brotherhood of man. Some day, however, we must rewrite the Constitution of these United States if the words of the immortal Lincoln are to live and endure and "A Government of the people, by the people and for the people" is to be assured to all its citizens. The Creator uncovered this great land of ours FOR THE PEOPLE. Somewhere I have read the words, "Lo, I uncover the land that I hid of old in the West as a sculptor uncovers his statute when he has wrought his best."

So today we write a new page in the history of the Society, and what shall be accomplished by the deliberations during the Twelfth Annual Convention shall mark a new milestone in its forward progress; shall determine its future as a great Society in a great country—your country and mine.

The American Electroplaters' Society was conceived with but one object in view—to raise the standard of the art of electroplating through co-operation and unity of purpose, one with each other, and each year accomplish some-

thing more than the preceding year for the good of its entire membership, for the good of the craft and for the betterment of commercial industry, of which it plays an important part.

Its constitution is so written and its governing laws have so far assured a continuation of its progress, but if its progress is to continue in the future it must not be subordinate to any society—it must be its equal. In its own field it must be supreme. If its votaries cannot maintain this supremacy we must show them—must teach them to solve their own problems.

Chemistry and electricity are the greatest factors in the world. They are the underlying principles upon which your adopted profession is built; they are the very foundation of the super-structure of which you are an essential part.

If you desire to maintin supremacy in your own field, if you do not want to be subordinate to any other society, then you must be masters in your own profession and your future progress will determine which it shall be.

I have briefly mentioned upon two former occasions, in New York and Detroit, that the American Electroplaters' Society should create an "Institute of Electroplating," controlled by the Society, for the benefit of every one of its members, and for the benefit of the comercial electroplating and metal finishing industries in the United States and Canada.

In the preamble of the Constitution of the American Electroplaters 'Society it states, in paragraph 2:

> "The object of this Society shall be the improvement of the art of electro deposition in all its branches, and the dissemination of the knowledge of its practice.
>
> "All laws and rules must be so formed that the Society will promote no other object than the education of its members in the principles of electroplating and finishing of metals, etc."

In Article IX, paragraph 2, it is stated that:

> "A Bureau of Education shall be established for the advancement of education of the members of the American Electroplaters' Society."

When I first conceived the idea of the formation of the National Electroplaters' Association of the United States and Canada, I had in mind also the eventual creation of an "Institute of Electroplating" and a "Bureau of Information" that would be controlled by the direction of the Supreme Society. In this Institute, which should belong to every member of the Society, should be worked out the problems and improvements in the art of electro deposition in all its branches, and the dissemination of the knowledge so gained to its entire membership.

In this Institute, if created, shall be taught the future platers of the United States and Canada, and perhaps from other lands far over the seas. Its problems shall be solved; its research work shall be accomplished and theory and practice shall be so co-ordinated that the real value of theory and practice in research work shall be immediate and tangible and not consume years to accomplish.

I have in mind work being accomplished by a special composition nickel anode by one of our own chemist electroplaters in an eastern city. The experiments were carried on under practical working conditions. It did not require years or even a year's research work to secure tangible evidence of their value. Within a few weeks the difference between theory and practical commercial application was known. No wonder that a gentleman well known to you all, through his interest in the Society, when he visited the plant in question and saw the results obtained, remarked: "It is true, the way is too long under present methods of research before we reach the goal."

This is why we need as a part of this Society of ours an Institute of Electroplating, where theory can be put to work under practical working conditions, where the real value of theory can be determined and something tangible result in a limited time for the benfit of all its membership and the industry at large. I know this is a big undertaking, but in America we are accustomed to big undertakings. It only needs the will to do and the courage, enthusiasm and co-operation of all to accomplish what we set out to accomplish. You may say it is a dream, but dreams sometimes come true. The conception of your Society was only a dream, but yet it came true. Many times I was told that

the effort would die in the attempt, but it did not die. If it had there would not be this wonderful representative gathering; there would not have been any great convention in Milwaukee; we would not be here today.

We came here for a purpose; let it be the Future Progress of the American Electroplaters' Society in the creation of the Foundation for the future "Institute of Electroplating and Finishing of Metals in the United States of America."

I know you will say it needs money to accomplish such a purpose. I agree it does; so let us rewrite the Constitution so that it shall read:

> "And each year shall be held in connection with the Annual Convention of the Society an Exposition of electroplated products of art and industry; of the chemicals used in electroplating and finishing; of the metals; of mechanical and electrical apparatus used in connection with the industry that shall mark as milestones the progress made each preceding year, and erect milestones for the future to mark its progress as the years succeed each other."
>
> "All profits that result from such expositions shall be used as a fund for the Institute of Electroplating and Fnishing of Metals and the work such an Institute is intended to accomplish."

Manufacturers of metal goods in all lines, wherever electro deposits or finishes are applied to their product will support the Institute, or whatever you may choose to term this Central Bureau of Information, which your Constitution tells you shall be established for the advancement of the education of the members of the Electroplaters' Society. I know this to be true because I have already approached some of them upon the subject, and they have promised to give financial aid. There are hundreds more who will do likewise.

The Detroit Branch's idea of a sustaining membership is a laudable one. The financial return from such a membership will help to create a fund for the Institute of Electroplating. Other great societies have a sustaining membership. It is honorary in its degree and so should our sustaining members be classed.

The activities of the American Electroplaters' Society must remain forever in its active membership, and in that degree of membership alone.

When I speak for an Institute of Electroplating or a Central Bureau of Education, where the same purposes shall be accomplished, I am not alone speaking for the United States, but for our Semi-Sister Republic of Canada. A number of its citizens in the cities of Toronto and Montreal are an integral part of this Society of ours, and in these cities Branches are maintained and splendid work is accomplished. No Chinese Wall divides us, only an imaginary line that a century or more of friendship has welded into a great chain of friendship, without a weakened link. The flags of the United States and Canada will never be unfurled in battle array as foe against foe; only in peace; and "Peace hath her victories."

Representatives of our Canadian Branches are here to make this Convention a mighty success. They will support us in every endeavor we may make to ensure the future progress of the American Electroplaters' Society, because they believe in the great principle of "One for all and all for one." They will play their part. They will undertake even to plan the First Annual Exposition in Canada, in support of the Institute of Electroplating in the United States. And we are going to give them that supreme opportunity because in 1925 we are going to Montreal to the Thirteenth Annual Convention of the American Electroplaters' Society. And to you, America, and to you, the Dominion of Canada, is left the future progress of the American Electroplaters' Society, to determine whether it shall endure; whether the work you have so far accomplished shall live on and on through the ages yet to come; or whether it shall perish ere its work has scarcely begun.

As we think so we are. The aphorism, "As a man thinketh in his heart so is he" embraces every member of this Society of ours. If we think we will make our Society great, just so great will it be. Our thoughts not only embrace our whole being but are so comprehensive as to reach out to every condition and circumstance of our life. A man is literally "What he thinks"; his character being the complete sum of all his thoughts. Man is a growth by law and

not a creation by artifice. He is made or unmade by himself in the armory of thought. He forges the weapon of life. He fashions the tools with which he builds for himself the Temple of Knowledge, of Joy and Strength, of Peace; or he may fashion the tools in thought by which he destroys himself and his future.

I have often wondered whether, as members of the great Society, we give sufficient time to the thought of its future progress, and if we took more time for concentration, whether it would not make us better platers, and, incidentally, better workmen, and each a betterman. Inward process of thought makes up the sum of character and life, and man can modify and alter these processes by bringing will and effort to bear upon them.

In your every day vocation as electroplaters thought alone can solve your problems. The more consistent your thought, the more conscieutious thought you apply to your problems, the easier and the more intelligent will be the solution of them. Everything that the human mind has produced has been due to thought. Everything we possess outside of those things that were created by the universal Laws of Nature had its origin in thought.

So, if you would make your Society great and yet greater, it must be through your thoughts. But thoughts must be transmitted into action. Kipling in his wonderful poem, "If," says:

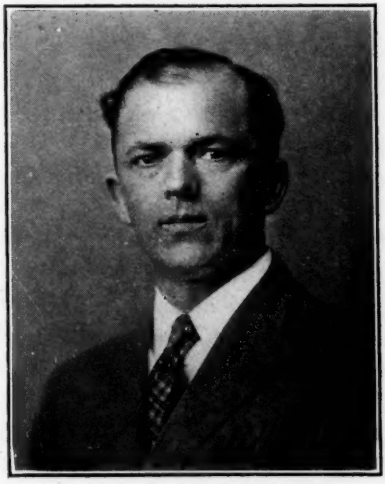
"If you can dream and not make dreams your master,
If you can think and yet not make thoughts your aim,
If you can meet with triumph and disaster and treat these
two imposters just the same,
Yours is the earth and everything that's in it,
And what is more, you will be a man, my son."

All achievements, whatever they may be, are the result of definitely directed thought, are governed by the same laws, and are of the same method. The only difference lies in the object of attainment. Let your thoughts be to think and plan for an Institute of Electroplating or a Bureau of Education. Let us all think as one and strive to emulate a noble principle of who can best work and best agree in the American Electroplaters' Society. Thus the future progress of the Society will be assured.

It is our fondest hopes that the Milwaukee Branch's splendid work in connection with the creation of the Twelfth Annual Convention shall be amply rewarded with great success; that the efforts they have put forth shall stand as a monument for future conventions of the Society, wherever they may be held.

We who have come here from distant cities pay due homage to this splendid city of Milwaukee, for we feel we have come among friends, and in parting wish to express our sincere appreciation for the splendid hospitality and entertainment you have provided for us during our short stay with you.

To those who have worked so faithfully to insure so great a success, we feel that you have fully learned that magnificent lesson, "What is worth doing at all is worth doing well," and in a measure you have assured to all of us the Future Progress of the American Electroplaters' Society, which can and will be continued by the aid of such splendid efforts as you have put forth, which proves to all of us that "In Union there is strength"; so in unity we shall progress in the future as we have done in the past."



**Editor**

**F. C. MESLE**

**Courtesy Metal Industry**

## A COMPARISON OF COPPER ANODES UNDER COMPARABLE WORKING CONDITIONS IN CYANIDE SOLUTIONS

June 11, 1924

W. Fraine

OBJECT OF TEST—To make a comparison of four different types of copper anodes for rate of efficiency of feeding electroplating solutions.

The four types of anodes were as follows:

Electrolytic Copper Anodes,
Rolled Copper Anodes,
Cast Copper Anodes,
Cast Copper Anodes (annealed).

The above copper anodes were all very pure copper (99.8% copper). The two cast types being slightly less pure due to oxides, etc., formed in casting.

The conditions under which this test was carried out are as follows:

1. The four soltuions used in this work were thoroughly mixed to insure uniformity in compositon, that is, the soltuions were of the same composition in all respects.
2. Each tank was equipped with a full set of the type of anodes to be run in that tank.
3. The same work was run in each of the four tanks at all times, that is, if keys were run in one tank, the same number of keys were run the same length of time in the time in the other three tanks.
4. Approximately the same solution temperature was used on all four tanks at all times.
5. Approximately the same current density was used on all four tanks at all times.
6. Sodium cyanide and copper cyanide were added to each soltuion in such quantities as to keep the solution up to its original compositon.
7. The solution of each tank was analyzed once each week to assist in keeping a constant composition.

On 1-11-23 the anodes were weighed and hung in the tanks and the solution analyzed.

**Tank 17-A—Electrolytic Anodes.**

Weight of anodes ..... 450.5 pounds

Analysis of solutions

| | | | | |
|---|---|---|---|---|
| Sodium Cyanide | 2.2 | ounces | per | gallon |
| Copper | 2.3 | " | " | " |
| Sodium Copper Cyanide | 5.0 | " | " | " |
| Sodium Carbonate | 12.0 | " | " | " |
| Total Solids | 19.2 | " | " | " |

**Tank 17-B—Rolled Anodes**

Weight of anodes ..... 463 pounds

Analysis of solutions

| | | | | |
|---|---|---|---|---|
| Sodium Cyanide | 2.2 | ounces | per | gallon |
| Copper | 2.3 | " | " | " |
| Sodium Copper Cyanide | 5.0 | " | " | " |
| Sodium Carbonate | 12.0 | " | " | " |
| Total Solids | 19.2 | " | " | " |

**Tank 18-A—Cast Anodes**

Weight of anodes ..... 437.5 pounds

Analysis of solutions

| | | | | |
|---|---|---|---|---|
| Sodium Cyanide | 2.3 | ounces | per | gallon |
| Copper | 2.4 | " | " | " |
| Sodium Copper Cyanide | 5.2 | " | " | " |
| Sodium Carbonate | 11.9 | " | " | " |
| Total Solids | 19.4 | " | " | " |

**Tank 18-B—Cast Anodes (Annealed)**

Weight of anodes ..... 439.5 pounds

Analysis of solutions

| | | | | |
|---|---|---|---|---|
| Sodium Cyanide | 2.5 | ounces | per | gallon |
| Copper | 2.4 | " | " | " |
| Sodium Copper Cyanide | 5.2 | " | " | " |
| Sodium Carbonate | 11.7 | " | " | " |
| Total Solids | 19.4 | " | " | " |

**Tank 17-A—Electrolytic Anodes**

Weight of anodes ..... 136 pounds

Loss in weight ..... 314.5 "

Analysis of solutions

| | | | | |
|---|---|---|---|---|
| Sodium Cyanide | 2.3 | ounces | per | gallon |
| Copper | 2.1 | " | " | " |
| Sodium Copper Cyanide | 4.6 | " | " | " |
| Sodium Carbonate | 13.0 | " | " | " |
| Total Solids | 19.9 | " | " | " |
| Increase in sodium carbonate | 1.0 | " | " | " |

**Tank 17-B—Rolled Anodes**

| | | |
|---|---|---|
| Weight of anodes | 171 | pounds |
| Loss in weight | 292 | " |
| Analysis of solutions | | |
| Sodium Cyanide | 2.4 | ounces per gallon |
| Copper | 2.0 | " " " |
| Sodium Copper Cyanide | 4.3 | " " " |
| Sodium Carbonate | 14.6 | " " " |
| Total Solids | 21.3 | " " " |
| Increase in sodium carbonate | 2.6 | " " " |

**Tank 18-A—Cast Anodes**

| | | |
|---|---|---|
| Weight of anodes | 198.5 | pounds |
| Loss in weight | 239 | " |
| Analysis of solutions | | |
| Sodium Cyanide | 2.2 | ounces per gallon |
| Copper | 1.5 | " " " |
| Sodium Copper Cyanide | 3.2 | " " " |
| Sodium Carbonate | 14.7 | " " " |
| Total Solids | 20.1 | " " " |
| Increase in sodium carbonate | 2.8 | " " " |

**Tank 18-B—Cast Anodes (Annealed)**

| | | |
|---|---|---|
| Weight of anodes | 242 | pounds |
| Loss in weight | 197.5 | " |
| Analysis of solutions | | |
| Sodium Cyanide | 2.4 | ounces per gallon |
| Copper | 1.4 | " " " |
| Sodium Copper Cyanide | 3.0 | " " " |
| Sodium Carbonate | 15.9 | " " " |
| Total Solids | 21.3 | " " " |
| Increase in sodium carbonate | 4.2 | " " " |

## COST OF DEPOSITED COPPER FROM THE TANKS USED IN THIS COMPARISON FOR THE PERIOD OF 6-11-23 TO 3-3-24

**Tank 17-A—Electrolytic Anodes**

| | Lbs. |
|---|---|
| Copper in solution at 6-11-23 | 33.2 |

| | | |
|---|---|---|
| (as copper cyanide, 46.4 lbs. at $0.44 lb.) | | $20.85 |
| Copper added to solution | 8.4 | |
| (as copper cyanide, 12 lbs. at $0.44 lb.) | | 5.28 |
| Copper from anodes | 314.5 | |
| (at $0.18 lb.) | | 56.61 |
| Sodium cyanide added to solution | 67.0 | |
| (at $0.22 lb.) | | 14.74 |
| Copper in solution at 3-3-24 | 30.3 | |
| (43.3 lbs. copper cyanide at $0.44 lb.) | | 19.05 |
| Total copper deposited, 6-11-23 to 3-3-24 | 325.8 | |
| Total cost of materials | | 78.43 |
| Cost of deposited copper, per pound | | 0.24 |
| **Tank 17-B—Rolled Anodes** | | |
| Copper in solution at 6-11-23 | 33.2 | |
| (as 47.4 lbs. copper cyanide at $0.44 lb.) | | 20.85 |
| Copper added to solution | 7.0 | |
| (as 10 lbs. copper cyanide at $0.44 lb.) | | 4.40 |
| Copper from anodes | 292.0 | |
| (at $0.1775 lb.) | | 51.83 |
| Sodium cyanide added to solution | 65. | |
| (at $0.22 lb.) | | 14.30 |
| Copper in solution on 3-3-24 | 29.0 | |
| (as 41.3 lbs. copper cyanide at $0.44 lb.) | | 18.17 |
| Total copper deposited, 6-11-23 to 3-3-23 | 303.3 | |
| Total cost of materials | | 73.21 |
| Cost of deposited copper, per pound | | 0.24 |
| **Tank 18-A—Cast Anodes** | | |
| Copper in solution at 6-11-23 | 34.7 | |
| (as 49.53 lbs. copper cyanide at $0.44 lb.) | | 21.78 |
| Copper added to solution | 30.8 | |
| (as 44 lbs. copper cyanide at $0.44 lb.) | | 19.36 |
| Copper from anodes | 239.0 | |
| (at $0.15 lb.) | | 35.85 |
| Sodium cyanide added to solution | 70.0 | |
| (at $0.22 lb.) | | 15.40 |
| Copper in solution on 3-3-24 | 21.6 | |
| (as 30.8 lbs. copper cyanide at $0.44 lb.) | | 13.55 |
| Total copper deposited, 6-11-23 to 3-3-24 | 282.9 | |
| Total cost of materials | | 78.84 |
| Cost of deposited copper, per pound | | 0.28 |

**Tank 18-B—Cast Anodes (Annealed)**

| | | |
|---|---|---|
| Copper in solution on 6-11-23 | 34.7 | |
| (as 49.5 lbs. copper cyanide at $0.44 lb.) | | 21.78 |
| Copper added to solution | 37.1 | |
| (as 53 lbs. copper cyanide at $0.44 lb.) | | 23.32 |
| Copper from anodes | 197.5 | |
| (at $0.15 lb.) | | 29.62 |
| Sodium cyanide added to solution | 79.0 | |
| (at $0.22 lb.) | | 17.38 |
| Copper in solution on 3-3-24 | 20.2 | |
| (as 28.9 lbs. copper cyanide at $0.44 lb.) | | 12.71 |
| Total copper deposited, 6-11-23 to 3-3-24 | 249.1 | |
| Total cost of materials | | 79.39 |
| Cost of deposited copper, per pound | | 0.32 |

**Condition of Anodes During Period of Comparison**

1. Coating of anodes during electrolysis:
   The cast anodes, and cast anodes (annealed), coated very badly. The electrolytic and rolled anodes coated slightl.
2. The slight coating on the electrolytic and rolled anodes would dissolve off over night. The heavy coating on the two types of cast anodes would not dissolve off over night.
3. The heavy bluish green coating on the cast anodes both types), could not be dissolved off by the use of free cyanide.
4. The coating which forms on the cast and cast (annealed) anodes is detrimental to the operation of the plating bath.

   (a) The efficiency of the bath is cut down.

   (b) The anodes are insulated to a certain extent by the coating, preventing proper corrosion of the anode.

   (c) This insulation of the anode lowers the current density through the bath.

   (d) Thus the solution is continually impoverished during electrolysis, making necessary the addition of copper cyanide to keep up the copper content of the solution.

   (e) Keeping the copper content of a solution

up by the addition of copper cyanide makes it more difficult to keep the solution of uniform composition, and to obtain a uniform deposit. Also it is more costly than when the copper content is kept up by anode corrosion.

5. The electrolytic anodes were of thin and uneven cross section on the edges. Pieces of the anodes dropped off into the tank. This did not occur on the rolled or cast anodes.

**Condition of the Solutions During the Period of Comparison**

The electrolytic and rolled anode solutions were about the same and are classed together as compared with the cast and cast (annealed) solutions.

1. The electrolyte in the tanks of the electrolytic and rolled anodes remained clear. Practically no sediment collected in the tank during the period of comparison. The electrolyte in the tanks of the cast anode became cloudy from suspended matter in the solution, and a very great amount of sediment collected in the bottom of the tank.
2. The sodium carbonate content of the electrolytic anode solution increased the least of any during the period of try-out, while the solution of cast (annealed) anodes increased the most in sodium carbonate content.
3. The copper content of the solutions of the electrolytic and rolled anodes was kept up by the solution of the anodes. No additions of copper cyanide being necessary. The solutions of the cast anodes decreased in copper content in spite of the frequent additions of copper cyanide.

**Conditions of the Deposits From the Four Tanks Under Observation**

1. The deposit obtained from the tanks with electrolytic and rolled anodes was more uniformly bright and smooth than that obtained from the tanks with the cast and cast (annealed) anodes.
2. More copper was deposited from the two tanks with electrolytic and rolled anodes than the other two tanks with cast anodes, in the period of the comparison.

   (a) The temperature of the electrolyte and the current density should influence this. However,

these factors were controlled as closely as possible and the indications are that the solutions with the electrolytic and roled anodes gave greater electrical efficiency than those with the cast anodes.

**Anode Efficiencies**

$$\frac{\text{Loss of weight of anodes}}{\text{Total copper deposited}} \times 100 = \%\ \text{efficiency}$$

Tank 17-A—Electrolytic anodes..Anode efficiency 96.8%
Tank 17-B—Rolled anodes .....Anode efficiency 96.3%
Tank 18-A—Cast anodes .....Anode efficiency 84.8%
Tank 18-B—Cast anodes (annealed) Anode efficiency 79.3%

**Conclusions**

1. The cast and cast (annealed) anodes are both outclassed in every respect by the electrolytic and rolled anodes. The cast (annealed) anodes were much less satisfactory than the cast anodes (unannealed). This is rather difficult to conceive, and the above data gives no indications of the cause except the greater sodium carbonate increase of the solution containing cast (annealed) anodes.
2. There is little to choose between the electrolytic and rolled anodes. However, the electrolytic anodes are slightly more satisfactory on a number of counts.
   (a) The anode efficiency is 0.5% higher.
   (b) The sodium carbonate content of the rolled anode solution increased 2.6 times as much as that of the electrolytic anode solution.
   (c) While the cost of deposited copper was the same per pound for both solutions, yet more copper was deposited from the bath with the electrolytic anodes than that with rolled anodes. This indicates a greater electrical efficiency, and the lower sodium carbonate concentration substantiates this.
   (d) A better appearing and more uniform deposit was obtained from the bath equipped with electrolytic anodes.
3. Microphotographs were taken of the four kinds of copper anodes. A marked difference in the structure and grain size can be observed. While both cast anodes

showed large grains the microphotograph shows that annealing has increased the size of the grain to a great extent.

On the other hand the rolled anodes showed small broken crystals, while the electrolytic anodes had long column-like crystals of small cross-section.

It is evident that the efficiency of the anode is affected by the structure and grain size. It may be that the conditions under which the larger grains were formed in the cast anodes allowed the impurities in the copper to segregate to the grain boundries, which act as envelopes surrounding the copper crystal. It is quite possible that the heavier grain boundries of these large crystals would retard the electrolytic corrosion of the anode, giving the results obtained in the above comparison.

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## PROGRESSIVE PRODUCTION METHODS AS APPLIED TO FINISHING DEPARTMENT

C. Van Deran

The installation of progressive production methods, offer a fine opportunity to the Electroplater, or metal finisher, to produce uniform finishes at a lower cost.

The first step of the installation of progressive production means that a definite plan or layout of all operations must be made, to eliminate unnecessary operations or movements.

In order to gain the best results from a progressive layout, you must have sufficient production of uniform articles to take the full time of a minimum number of operators that can be worked efficiently.

It is not necessary that this volume of production be all of one kind of piece. It may be composed of several kinds, provided the methods of finishing are similar. With this in view, it is usually possible to layout a cycle of operations that can be worked efficiently from 25 to 40% of the maximum production possible, to be obtained. It is only necessary to add additional operators, to obtain the full capacity of the equipment.

At all loads the operators are working at maximum efficiency, and by the use of additional operators and the

sub-dividing of operators, under increased loads, we ultimately work the equipment at maximum capacity.

Polishing being one of the largest single items of finishing from a cost standpoint, should be given more thought and consideration by all metal finishers.

Machine polishing will greatly reduce the cost, wherever production warrants their use, and as machine polishing is only in its infancy, there should be closer cooperation between the metal finisher and the machine tool builder for the development of this important part of the industry.

In the development of machine polishing, it will be found necessary to standardize the raw material from which articles are made.

It is surprising the number of articles that can be machine polished in the flat before forming when given thought by the practical machine man and the metal finisher.

With the development of machine polishing, it will be found necessary to maintain better wheel conditions than is required for hand polishing as machine polishing is a question of accuracy. After polishing operations are completed, they are followed by the most important operation of finishing, namely Electroplating. When laying out a plating department on a progressive production basis, we find one of our most difficult problems, namely, the various cleaning problems, and the various plating periods required for different classes of work to be plated. By segregating the different classes of work, it is possible to specialize cleaning and plating solutions to the various classes of work for which they are best adapted.

In many cases, we find that we have rapid cleaning and plating soltuions that are too rapid, and in other cases too slow. This condition must be eliminated before any progressive plating method can be worked efficiently.

Other conditions to be considered are wiring and racking of articles to be plated, whever possible efficient racks should be designed and used as wiring is a very expensive operation.

Moving cathode plating tanks should be used wherever articles to be plated are of a permissible design as they

eliminate many unnecessary steps, and give a better assurance of more uniform deposits.

Burnishing and plating permit finishing of quantity production of small parts at a low cost.

By controlling speed and carefully loading barrels splendid finishes may be obtained.

It is necessary to specialize and standardize cleaning and plating solutions for the various classes of work to obtain successful progressive plating layouts.

The final finishing operation of buffing in many respects is similar to polishing operations as to the future development of automatic buffing machines.

In other finishing departments, such as lacquering and enameling, it is possible to lower costs by installation of progressive production methods.

The tendency on the part of the equipment builder has been to build their equipment too light. This undoubtedly has been done to reduce cost, but if progressive production methods are to succeed, this tendency must be reversed. The tie up of any piece of equipment will tie up the entire line. More attention must be given to the ruggedness of equipment ,beter lubrication, and better ventilation.

In all finishing departments, time limits or price rates should be based on man hours and not on machine capacity or plating periods.

If machines or plating periods do not require operators full time their excess time should be taken up by other operations.

Another item to be given careful consideration is the specializing of operators. Often times operators are very inefficient on some operations and when transferred to work that they are better adapted to, they become very efficient.

When operators are specialized, it is possible to get better work, more production, and better co-operation. Without co-operation, progressive production methods will not be successful.

# BRANCH NEWS

### Indianapolis Branch

Fine weather, fine crowd and fine picnic grounds, such were the comments of members of Indianapolis Branch at their basket picnic held August 10 at Northern Beach, north of the city. Unfortunately, one member was out of town and could not attend, or our city member attendance would have been 100 per cent. With the members and families and invited guests the total attendance was 71 persons. making a very nice picnic crowd. After unloading in the grove you can bet there was no time lost in starting activities, as there was a rush for the ball diamonds and horseshoe grounds. Ben Aufderheide was late getting to the grounds, having started out with his family and lost his way, claiming he passed through Noblesville, Anderson and Muncie looking for the place. Ben needs a chiffoneer. The dinner was everything, and then some, that a picnic dinner should be; excellent surroundings, ideal weather, plenty of joy and mirth and, last but not least, an abundance to eat and drink (although someone said Miss Lamoureux fell short on cream). After dinner there were games and races for prizes that produced a great deal of fun, and before breaking up we had a watermelon-eating contest for a prize, which was won by Mrs. R. Hennessey. It was sure a treat to see that little lady behind a huge piece of melon, going to it seeds and all, and I suppose if Richard had not been there to grab her she would have swallowed the rine. Too much praise cannot be given to the committee on arrangements—Messrs. Warner, Maze and McCracken. The ladies. too, are to be praised for the active part they took and the time and labor they devoted. In connection with this I wish to announce that our next regular meeting will be held at Hotel Denison, September 27, at 4:30 o'clock P. M. Ladies to meet us at 7:30 P. M. to attend theatre.

### Waterbury Branch

The members of Waterbury Branch are anxiously awaiting the opening meeting in September. The committe having the affair in charge announces that Friday evening, September 12, is the date. On this occasion it is expected that every member, both in and out of town, will make a special effort to be present. The booster committee, which was appointed some time ago to arouse and create a greater interest in the doings of the local branch, have been very energetic the past few weeks, and as a result of their labors a large and enthusiastic gathering is looked for. Plans will be formulated at this meeting for a series of talks and lectures on topics of interest to the members and their friends. The social side of the meetings will also be taken care of. The campaign for new members is also under way, and a goodly increase in the membership is looked for in the near future.

### Grand Rapids Branch

Grand Rapids branch met August 13, at the Vocational High School. Due to the absence of President Oats, Vice-President Rickson took the chair. After going over the minutes, we had a brief report of convention by Van Slyuters. We also voted to accept Mr. Duche's offer to instruct us in general plating such as the action of each element in the solution. We then adjourned.

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### Rochester Branch

The Rochester Branch A. E. S. had election of officers June 14th. The following were elected: Pres., Edwin Crowley; Vice-Pres., Thomas Harper; Secretary and Treasurer, C. A. Reama; Librarian, T. Harper; Trustees, S. P. Gartland, A. Doeing, R. Lopez. The newly elected officers wish to make Rochester Branch a bigger and better one, would also like to see some of our out of town members attend some of the meetings.

Meetings will be held as usual every second and fourth Saturdays in each month at Powers Hotel at 8 P. M.

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### Toronto Branch

Although the night was decidedly warm, our members turned out in goodly numbers on July 28th. All officers were present and business was conducted briskly. The delegates report of the Milwaukee convention consisted of 22 sheets of fools cap and includd all the details. Some of our members suggested a picnic, but nothing was decided on. But a get-together of some kind will probably be arranged for early winter. Pitting of nickel deposits and spotting out was discussed briefly. We will not meet in August. Next meeting will be September 22nd, and we hope to hav ea program of exceptional merit prepared for the winter months. We all anticipate a considerable increase in membership during the coming year. We will welcome any information respecting spotting out in any form.

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### Cleveland Branch

The Cleveland Branch of the American Electroplaters Society met for their regular July business meeting at the Hotel Winton. The meeting was called to order at 8 P. M. The minutes of the previous meeting were read and approved as read. It was decided to hold our meetings the first Saturday in the month, instead of the last Saturday. The next meeting to be held the first Saturday in September and the Secretary was instructed to notify the members by letter. The Secretary was instructed to write the Supreme Secretary to find out by what right the other branches have in using the Metal Industry and the Brass World for their publications, when the by-laws read, that to do so they must have the consent of two-thirds of the Executive Board. The application of Philip Seubert, 4405 Irene Avenue was received. John C. Mullinnix, 1681 Crawford Road., was elected to membership. After hearing the report of the delegates to the conventions, the meeting was adjourned at 10:45 P. M.

### Chicago Branch

Chicago Branch, A. E. S., held its regular meeting at the Atlantic Hotel, 316 South Clark street. Meeting called to order, President F. J. Hanlon presiding. After the reading of minutes, etc., President Hanlon called upon several visitors for a talk, after which meeting was turned over to librarian, who found a very interesting subject to work on. Subject, "Nickel Cyanide and Acid Copper Solutions."

H. S. Kneeland, Secretary.

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### Bridgeport Branch

The Bridgeport Branch held its regular meeting August 1. The meeting was called to order by President William Flaherty. There were twenty members present.

The secretary reported that there were no answers to the advertisement to rent the rooms out.

The drawing for the Atwater-Kent radio set took place after the business was finished. Mr. Hawley, 114 Poplar street, Bridgeport, won the set.

Thanks to the interest and help of the branches and our members we were very pleased with the financial success of this raffle.

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## APPLICATIONS FOR MEMBERSHIP

### Chicago Branch

Walter Lockerbie .....4433 Greenview Ave., Chicago, Ill.

### Cleveland Branch

Mr. Phillip Seubert .....4405 Irene Ave., Cleveland, Ohio

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## ELECTED TO MEMBERSHIP

### Cleveland Branch

John C. Mullenix, Active .....1681 Crawford road, Cleveland

### Chicago Branch

Max Ludwig .....Pullman Car Works, Pullman, Ill.

### Bridgeport Branch

F. F. Lancaster, Associate .....289 Cortland Ave., Bridgeport, Conn.

### Cincinnati Branch

J. J. Bell .....1904 Cedar St., Nashville, Tenn

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### Research Committee

Appointed for the fiscal year of 1924-25 is Mr. R. L. Sheperd, Detroit Branch, chairman; Mr. S. E. Hedden, Pittsburgh, Branch, and Mr. Philip Uhl of the Philadelphia Branch, and I believe that this committee will wish that every member of the society just drop them a line when in trouble that they may be able to advance ideas to the Bureau of Standards to work out for advancement of our industry.